

Work Order ID 74585

Monday, October 03, 2011 11:31:20 AM



Page 1

Item ID: D350-748-141TRN

Accept



Setup Start



Revision ID: U/R

Item Name: Crosstube Turning Detail

Stop



Start Date: 10/3/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 10/7/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan: M.L. J

Date: 11/10/03 Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D350-748-141

U/R

OK 11.10.02

100

0.00



MORI SEIKI CNC LATHE LARGE

Mori Seiki

Memo

0.00

Mori Seiki CNC Lathe Large

- 1-Fill tube with sand & install plugs on both ends as per Folio FA648
- 2-Turn first side as per Folio FA648
- 3- File transition lines smooth.
- FOLIO REV: AA
- DWG REV: 2

110

QC1- Inspect dimensions to dimension sheet

0.00



QC

Memo

0.00

Quality Control

1 Ø
amm. L 11/11/02

1 Ø
amm. L 11/11/02

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 74585

Page 2

Monday, October 03, 2011 11:31:20 AM

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Revision ID:	U/R				Stop	
Item Name:	Crosstube Turning Detail					
Start Date:	10/3/2011	Start Qty: 1.00				
Required Date:	10/7/2011	Req'd Qty: 1.00				
Reference:						

Approvals:	Process Plan:	Date:	Tooling:	Date:	Run	Start	
	QC:	Date:	SPC (Y/N):	Date:		Stop	

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120 Mori Seiki Mori Seiki CNC Lathe Large	MORI SEIKI CNC LATHE LARGE Memo 1-Turn second side as per Folio FA648 2- File transition lines smooth. 3-Scribe Part & Batch as per Dwg D350-748-141 FOLIO REV: <u>AE</u> DWG REV: <u>E</u>	0.00 0.00				1	0		
130 QC Quality Control	QC1- Inspect dimensions to dimension sheet Memo	0.00 0.00				1	0		
140 QC Quality Control	QC8- Inspect parts - second check Memo	0.00 0.00							

mm.L 11/11/02

mm.L 11/11/02

DP 11-11-3

W/O:		WORK ORDER CHANGES					
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Accept



Setup Start



Revision ID: U/R

Stop



Item Name: Crosstube Turning Detail

Start Date: 10/3/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 10/7/2011 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180 QC Quality Control	QC6- Inspect dimensions to drawing Memo	0.00 0.00		5 n/12/21					
190 Packaging Packaging	Packaging Memo Identify and stock in kanban rack Location: <u>Bunch hall</u>	0.00 0.00						11- 12.22	
200 QC Quality Control	QC21- Final Inspection - Work Order Release Memo	0.00 0.00							11/12/22

11-12-23

W/O:		WORK ORDER CHANGES					
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Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

Picklist Print

Page 1

Monday, October 03, 2011 11:31:26 AM

Work Order ID: 74585



Parent Item: D350-748-141TRN



Parent Item Name: Crosstube Turning Detail

Start Date: 10/3/2011

Required Date: 10/7/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:A New Issue 08-03-06 DD verified by:ec
 IPP Rev B Removed polish 08.04.02 EC verified by : DD
 IPP Rev C Remove LPS-3 08.06.23 EC verified by DD IPP Rev C
 11.02.24 as per dwg rev.F DD verf: JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6015-125 		Manufactured	No			110	Each	22.0000	1	1			

Crosstube Material

Location

Loc Qty

Loc Code

HALL

22

61380

22

1 mm/l 11/10/31

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NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order: 74585
Description: Crosstube Assembly (AS350/355 High Fwd)		Part Number: D350-748-141
Inspection Dwg: D350-748-141 Rev: F		Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

Inspection Sheet	Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.240	+0.005/-0.000	2.245	/		vern	CWC-08
	2.180	+0.005/-0.000	2.185	/		"	
	2.180	+0.005/-0.000	2.185	/		"	
	2.237	+0.005/-0.000	2.242	/		"	
	2.272	+0.005/-0.000	2.277	/		"	
	2.306	+0.005/-0.000	2.310	/		"	
	2.339	+0.007/-0.000	2.346	/		"	
	2.339	+0.007/-0.000	2.342	/		"	
	0.062	+/-0.010	.062	/		vern	CWC-08
	4.26	+/-0.030	4.265	/		"	
	R0.063	+/-0.010	.063	/		RB	
	R0.50	+/-0.030	.500	/		"	
SIDE B	2.240	+0.005/-0.000	2.245	/		vern	CWC-08
	2.180	+0.005/-0.000	2.185	/		"	
	2.180	+0.005/-0.000	2.185	/		"	
	2.237	+0.005/-0.000	2.242	/		"	
	2.272	+0.005/-0.000	2.277	/		"	
	2.306	+0.005/-0.000	2.311	/		"	
	2.339	+0.007/-0.000	2.346	/		"	
	2.339	+0.007/-0.000	2.346	/		"	
	0.062	+/-0.010	.062	/		vern	CWC-08
	4.26	+/-0.030	4.265	/		"	
	R0.063	+/-0.010	.063	/		RB	
	R0.50	+/-0.030	.500	/		"	
	110.27	+/-0.060	110.265	/		tape	MM-L-02

Measured by: MM/L	Audited by: [Signature]	Preliminary Approval:
Date: 11/11/1	Date: 11-11-3	Date:

Rev	Date	Change	Revised by	Approved
A	06.11.09	New Issue (P/O D350-748-101)	KJ/JLM	
B	07.10.24	Dwg Rev updated	KJ/EC/DD	
C	11.01.20	Dwg Rev updated	KJ	
D	11.07.26	Tolerance revised for 2.339 dimensions	KJ	[Signature]

W/O:		WORK ORDER CHANGES					
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Item	Qty -141	Part Number	Description
1	X	D350-748-141	CROSSTUBE ASSEMBLY (AS 350/355 HI FWD)
2	1	D6015-125	CROSSTUBE (OR D6017-115)
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6015-125 OR D6017-115
FINISHED LENGTH = 110.270±0.06
- 2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-416B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: DART PART NUMBER "D350-748-141" AND BATCH NUMBER ON INSIDE OF CUFF
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 30.45 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- 9) BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO
BENDING IS 6% BASED ON O.D.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING. ACCEPTABLE TO
VERIFY TENSILE STRENGTH BY HARDNESS TEST PER ASTM E18 TO 40-45 HRC.
- 12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE,
CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES,
NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY.
CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE
MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO
CRACKING/CHIPPING/GROOVES.
- 14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT
NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 15) MAX TWIST AFTER BENDING: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN
CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.25 (ZN C1-3).

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT

WITHOUT NOTICE
WORK ORDER

NO. *M.E. 8*

74585

11/10/03

UNDER REVIEW

RELEASED
2011-01-18

F	ADD HRC TEST OPTION (B8-1) PER PAR 09-040, ADD TWIST LIMIT (A8-1, C1-3), ADD D6015-125 OPTION (C8-1), STOCK DIM NOW MACHINED (D1-4)	CP	10.11.23
E	REVISE GENERAL NOTES; UPDATE TO CURRENT ADD STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A6-3); TOLERANCES (ZN C8-3, D1-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6017-115 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN	<i>JP</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	<i>JP</i>		
CHECKED	<i>JP</i>	DRAWING NO.	REV. F
MFG. APPR.	<i>JP</i>	D350-748-141	SHEET 1 OF 4
APPROVED	<i>JP</i>	TITLE	SCALE
DE APPR.	<i>JP</i>	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	10.11.23	COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR OWNED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

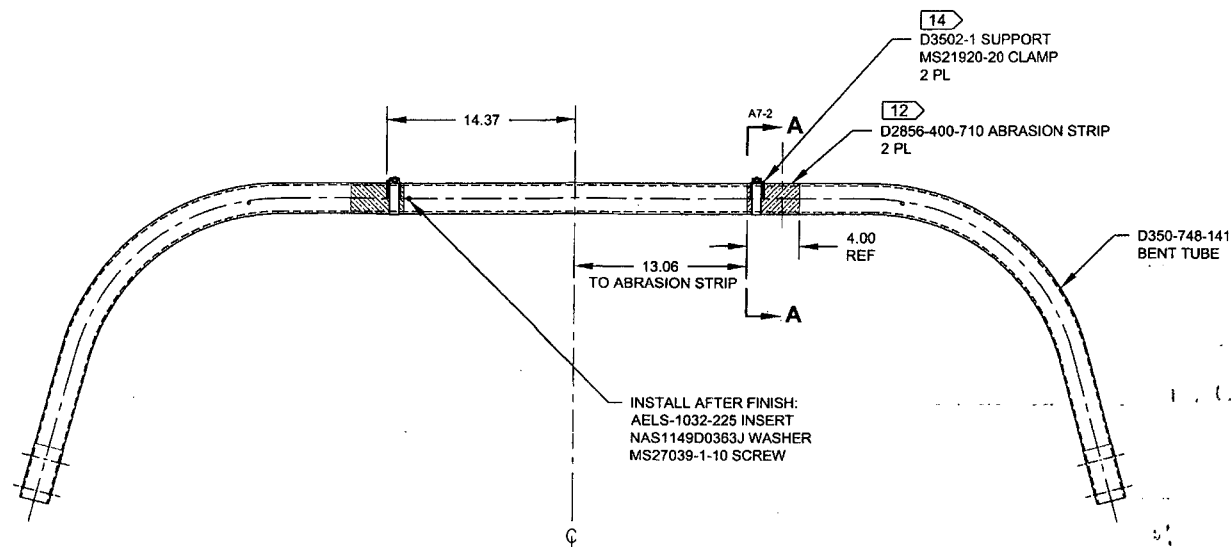
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

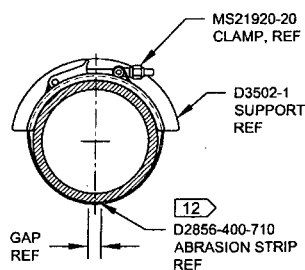
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74585



**D350-748-141
ASSEMBLY DETAIL**



SECTION A-A D4-2
SCALE 4X

UNDER REVIEW

11.07.11

RELEASED
2011-01-30

DESIGN	JP	DART AEROSPACE LTD	
DRAWN	JP	HAWKESBURY, ONTARIO, CANADA	
CHECKED	J	DRAWING NO.	REV. F
MFG. APPR.	E	D350-748-141	SHEET 2 OF 4
APPROVED	HA	TITLE	SCALE
DE APPR.	HA	CROSSTUBE (AS 350/355 HI FWD)	NTS
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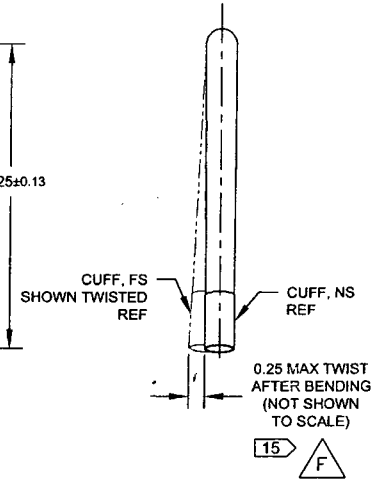
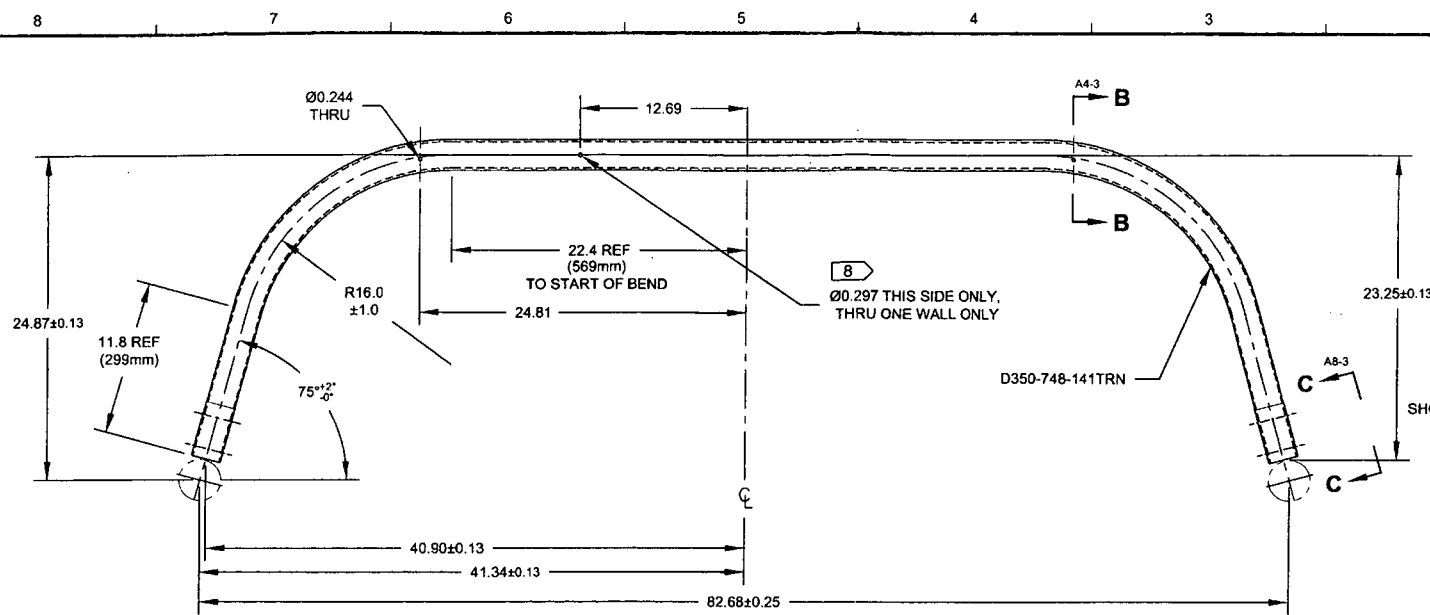
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Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

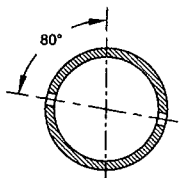
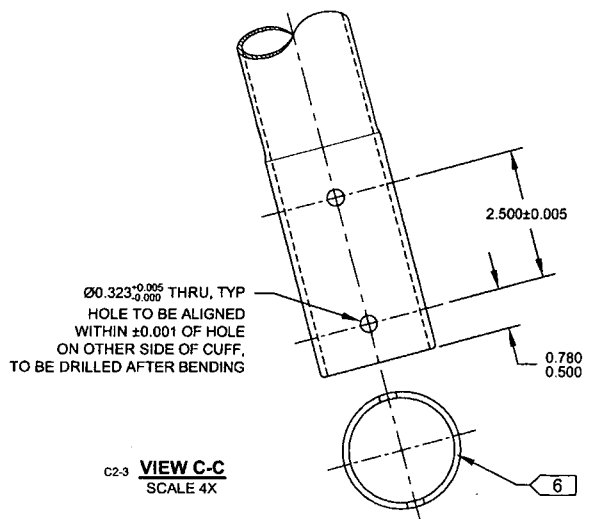
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74585



D350-748-141
BENDING AND DRILLING DETAIL 10



SECTION B-B D3-3
SCALE 4X

UNDER REVIEW
11.27.12

RELEASED
2011-01-18

DESIGN	QP	DART AEROSPACE LTD	
DRAWN	QP	HAWKESBURY, ONTARIO, CANADA	
CHECKED	J	DRAWING NO.	REV. F
MFG. APPR.	C	D350-748-141	SHEET 3 OF 4
APPROVED	H	TITLE	SCALE
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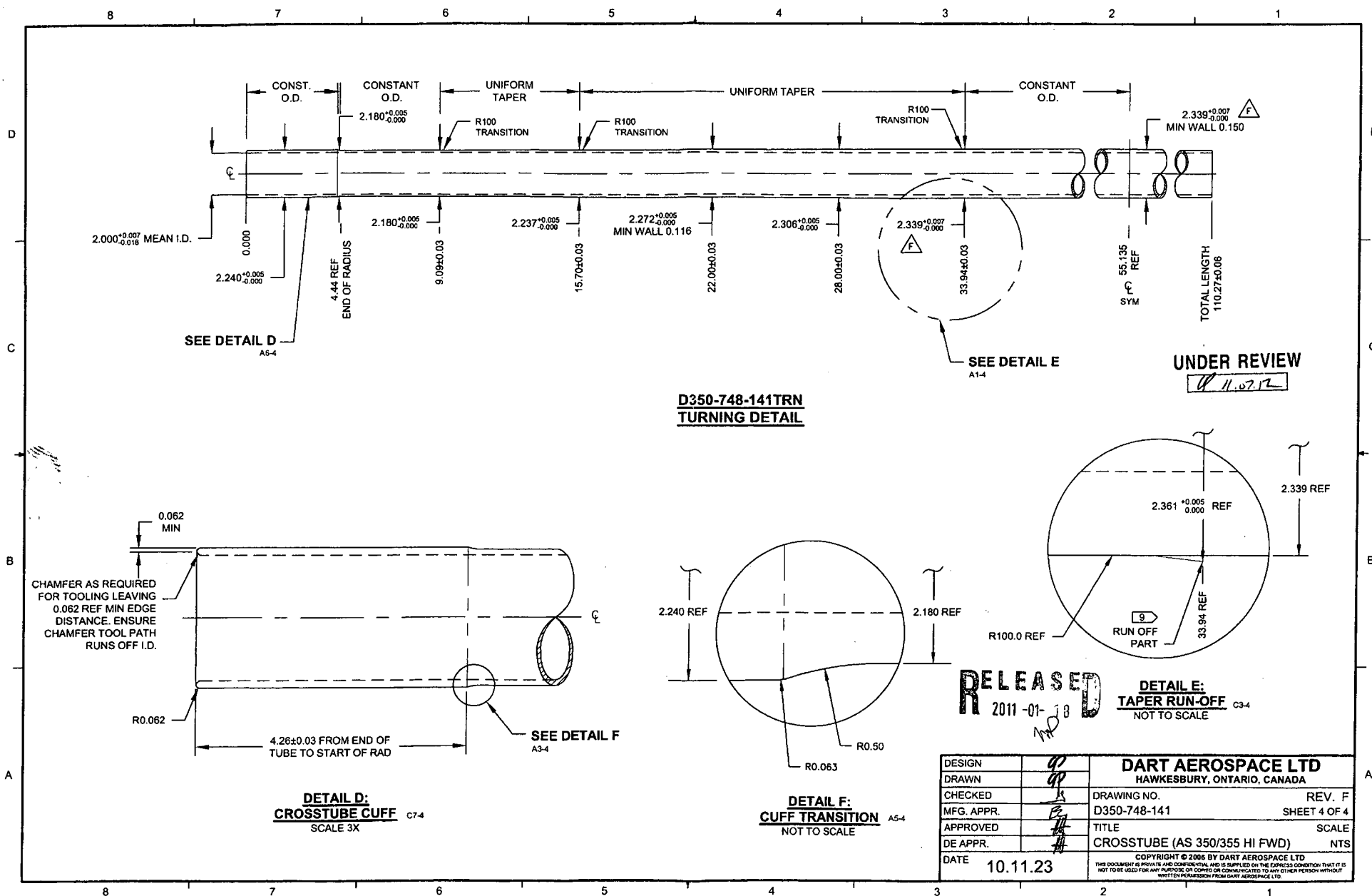
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VAC AERO
INTERNATIONAL INC.

RELEASE NOTE

GST No.: R105468102

OAK 136092-1



HEAD OFFICE
1371 SPEERS ROAD, OAKVILLE, ONTARIO
CANADA L6L 2X5
TEL: (905) 827-4171 FAX: (905) 827-7489



2009 WYECROFT ROAD, UNIT B
OAKVILLE, ONTARIO
CANADA L6L 6J4
TEL: (905) 827-7377 FAX: (905) 827-1380



QUEBEC DIVISION
7450 RUE VÉRITÉ STREET, ST. LAURENT, QUÉBEC
CANADA H4S 1C5
TEL: (514) 334-4240 FAX: (514) 334-6269

12/13/2011

MM/DD/YYYY

PAGE: 1

1DAR01

LL TO: DART AEROSPACE LTD.
1270 ABERDEEN ST.
HAWKESBURY, ON

SHIP TO: DART AEROSPACE LTD.
1270 ABERDEEN ST.
HAWKESBURY, ON

K6A 1K7

K6A 1K7

DATE SHIPPED	SHIP VIA	F.O.B.
12/13/2011		ORIGIN
CUSTOMER P/O No.	JOB No.	TERMS
15376		NET 30 DAYS

PART No.	DESCRIPTION	UOM	QTY ORD	QTY SHPD	TEST RESULTS
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350-748 241/-141 CROSS TUBE EA 8 8

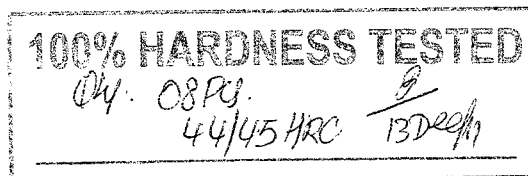
Process Specifications: Procedure: 4353
HEAT TREATED TO 180 KSI MIN. PER AMS 2759-1E
100% HARDNESS CHECKED AS PER ASTM E-18 40-45 HRC
MATERIAL: 4130

P/N D350-748-241
B73376, B73378, B73379, B73377
4 PCS

P/N D350-748-141
B74587, B74585, B74586, B74584
4 PCS

GRIT BLASTED

Su/12/21



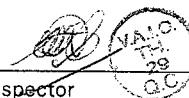
hereby certify that the material covered by this release note has been inspected and tested and conforms to all specifications relevant hereto in accordance with the conditions of the contract / or purchase order.

ON BEHALF OF VAC AERO INTERNATIONAL INC.



METAL TREATING INSTITUTE

Authorized Q.C. Inspector



VACUUM BRAZING - HEAT TREATING - SPECIAL PROCESSING - FURNACE EQUIPMENT
TURNING COMPONENT OVERHAUL - PLASMA AND OTHER COATINGS